AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A digital integrated circuit BTSC signal encoder for encoding audio signals, comprising:

(A) a higher order IIR digital filter implemented using an allpass decomposition architecture;

(B) matrix means for receiving a digital left channel audio signal and a digital right channel audio signal, comprising means for summing said digital left and right channel audio signals and thereby generating a digital sum signal, and including means for subtracting one of said digital left and right channel audio signals from the other of said digital left and right channel audio signals and thereby generating a digital difference signal;

(C) sum channel processing means for processing said digital sum signal; and

(D) difference channel processing means for digitally processing said digital difference signal;

wherein the higher order ~~input low pass~~ IIR digital filter, matrix means, sum channel processing means and the difference channel processing means operate at a first sample rate to substantially match BTSC analog filter transform functions in both magnitude and phase.

2. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a Cauer low pass filter.

3. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises an input low pass filter.

4. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises an output low pass filter.

5. (Currently Amended) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a sum of multiple cascades of lower order allpass filters.

6. (Currently Amended) The BTSC signal encoder of claim 5, wherein [[the]] each cascade of lower order allpass filters comprises a first or second order allpass filter.

7. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a Butterworth low pass filter.

8. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a pre-emphasis filter in the BTSC encoder.

9 (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a bandpass filter in the BTSC encoder.

10. (Original) The BTSC signal encoder of claim 1, wherein the higher order IIR digital filter comprises a variable emphasis compander filter in the BTSC encoder.

11. (Currently Amended) An integrated circuit digital BTSC encoder that is operable to encode first and second digital audio signals into a BTSC encoded signal comprising (a) a sum channel processor comprising a first digital filter for digitally processing a digital sum signal and (b) a difference channel processor comprising a second digital filter for digitally processing a digital difference signal, comprising:

a higher order digital filter comprising ~~constructed of~~ a cascade of lower order allpass filters for filtering a digital audio signal as part of the BTSC encoding process;

wherein the digital BTSC encoder operates at a sample rate of at least approximately 150-200 kHz so that said digital filters in the sum channel

processor and the difference channel processor substantially match BTSC analog filter transform functions in both magnitude and phase.

12. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises a Cauer low pass filter.

13. (Currently Amended) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises ~~a Cauer low pass IIR filter~~ a sum of multiple cascades of lower order allpass filters.

14. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises an eleventh order Cauer low pass IIR filter.

15. (Original) The integrated circuit digital BTSC encoder of claim 14, wherein the cascade of lower order allpass filters comprises a first order allpass filter and a plurality of second order allpass filters.

16. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises a Butterworth low pass filter.

17. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the sum channel processor, difference channel processor and higher order digital filter are fabricated on a single silicon substrate using CMOS processing.

18. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises a pre-emphasis filter in the BTSC encoder.

19. (Original) The integrated circuit digital BTSC encoder of claim 11, wherein the higher order digital filter comprises a bandpass filter in the BTSC encoder.

20. (Currently Amended) A single chip set top box integrated circuit digital BTSC encoder that is operable to encode first and second digital audio signals into a BTSC encoded signal, comprising a higher order IIR filter implemented using an allpass decomposition filter structure comprising a sum of two allpass filter stages, where each allpass filter stage comprises a plurality of lower order allpass IIR filters~~, each lower order allpass IIR filter having no limit cycle oscillations and a flat response~~.

21. (Original) The digital BTSC encoder of claims 20, where in the lower order allpass IIR filters comprise a first or second order allpass filter.